

### REMARKS

Reconsideration of the subject application it is requested in view of the following remarks.

Claims 52-65 and 86-89 are the subject of the Office action.

The search performed by the examiner in the course of substantively examining the claims is appreciated. Also appreciated is the examiner's more detailed explanation of the previous restriction requirement.

The status of claims 56 and 63-65 is acknowledged.

Claims 52-55, 57, 59-62, and 86-89 stand rejected for alleged anticipation (35 U.S.C. §102(b)) by Koch. This rejection is traversed.

Independent claim 52 is directed to an illumination-optical system that comprises a light source, a collimator, a fly's-eye mirror, and a condenser. The light source emits EUV light. The collimator is located downstream of the light source. The fly's-eye mirror is located downstream of the collimator and comprises multiple unit mirrors. The condenser is located downstream of the fly's-eye mirror. The illumination-optical system Köhler-illuminates a prescribed illumination area on the emission side of the condenser, wherein the illumination area includes one or more illumination irregularities. At least one of the unit mirrors of the fly's-eye mirror is a correction mirror that has reflectivity irregularities configured to correct at least a portion of the one or more illumination irregularities in the illumination area.

According to the specification (page 2, lines 4-7), "illumination irregularities" refer to, for example, uneven illumination distribution and uneven light-intensity distribution occurring at the illuminated surface (reticle surface, surface of a wafer for exposure, or similar)." Example illumination irregularities are shown in FIG. 2 and discussed in the specification on page 14, lines 16-23. In FIG. 2 the example region Ea on the reticle surface R is an illumination irregularity having a comparatively high illumination intensity relative to other illuminated regions of the reticle surface. In the other example regions Eb and Ec, the illumination intensity is comparatively low. (See FIG. 2.)

FIGS. 14A and 14B depict respective fly's-eye mirrors each comprising multiple unit mirrors. FIG. 3 shows exemplary unit mirrors of a fly's-eye mirror similar to that shown in FIG. 14A. Three rows of unit mirrors are shown. The top row includes five unit mirrors 13b each

having a reflectivity irregularity for correcting the illumination irregularity Eb shown in FIG. 2. The middle row includes six unit mirrors 13a each having a reflectivity irregularity for correcting the illumination irregularity Ea shown in FIG. 2. The bottom row includes six unit mirrors 13c each having a reflectivity irregularity for correcting the illumination irregularity Bc shown in FIG. 2. See specification page 15, lines 3-11. See also, for example, FIGS. 4-6 and accompanying discussion in the specification. From these figures and discussion, whereas each of the correction mirrors 13a, 13b, 13c has a respective reflecting surface shape (concave), each of these surface shapes also has at least one localized region (e.g., Ea, Eb, or Ec) providing a respective reflectivity irregularity compared to the rest of the surface of the respective unit mirror. Koch does not disclose this at all.

Koch discusses fly's-eye mirrors comprising multiple unit mirrors. FIG. 3A, for example, depicts a concave fly's-eye mirror 16 comprising multiple unit mirrors 42. Similarly, FIG. 4A depicts a convex fly's-eye mirror 18 comprising multiple unit mirrors 52. The Office action refers to col. 5, lines 10-59 of Koch as allegedly disclosing a fly's-eye mirror including at least one unit mirror having reflectivity irregularities configured to correct at least a portion of one or more illumination irregularities in the illumination area. This contention is incorrect. There is nothing in the cited text of Koch directed to a fly's-eye mirror having at least one unit mirror configured as claimed. In other words, none of the unit mirrors of Koch's fly's-eye mirrors has any kind of reflectivity irregularity or any means of providing reflectivity irregularities. Also, there is no disclosure whatsoever in Koch of providing a unit mirror with a reflectivity irregularity for any purpose.

The cited text of Koch (col. 5, lines 31-38) does mention that positioning or axial displacement of a fly's-eye mirror or individual unit mirrors ("elements") thereof can be accomplished by pistons or the like contacting the mirror or unit mirror. However, such pistons move the entire respective mirror or unit mirror to which the pistons are attached, and do not provide any means of providing the surface of any unit mirror with a reflectivity irregularity compared to the rest of the surface.

Therefore, independent claim 52 is not anticipated by or obvious from Koch.

Each of claims 53-58 and 86-87 depends from independent claim 52 and thus includes the entire combination of features recited in claim 52. Each of claims 53-58 and 86-87 also adds one or more respective features to the combination recited in claim 52. Therefore, each of claims

53-58 and 86-87 is properly allowable over Koch for the same reasons discussed above regarding claim 52.

Independent claim 59 is directed to an illumination-optical system that comprises a light source, a collimator, a fly's-eye mirror, and a condenser. The light source emits EUV light. The collimator is located downstream of the light source. The fly's-eye mirror is located downstream of the collimator and comprises multiple unit mirrors each having an incidence side. The condenser is located downstream of the fly's-eye mirror and has an emission side. The illumination optical system Köhler-illuminates a prescribed illumination area on the emission side of the condenser, wherein the illumination area includes one or more illumination irregularities. At least one of the unit mirrors of the fly's-eye mirror includes a respective correction filter situated on the incidence side of the unit mirror. The correction filter has transmissivity irregularities configured to correct at least a portion of the one or more illumination irregularities in the illumination area.

Applicant points out that the comments in the large paragraph on page 5 of the Office action do address the particular features recited in claim 59 (e.g., correction filters). Therefore, the Office has not set forth a *prima facie* case with respect to claim 59 and its dependents.

Example correction filters are shown in FIGS. 16, 17, and 18 of the subject application. Koch provides no disclosure even remotely suggestive of such features or of any reason to provide such features.

Therefore, claim 59 is properly allowable over Koch.

Each of claims 60-65 and 88-89 depends from claim 59 and hence includes the entire combination of features recited in claim 59. Furthermore, each of claims 60-65 and 88-89 adds at least one respective feature to the combination recited in claim 59. Therefore, claims 60-65 and 88-89 are properly allowable for all reasons discussed above regarding claim 59.

Therefore, each of claims 52-65 and 86-89 is properly allowable, and early action to such end is thereby respectfully requested.


If any issues remain after consideration and entry of this paper, the examiner is requested to contact the undersigned to schedule an interview.

Respectfully submitted,

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